UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 2 7 2005

MEMORANDUM

SUBJECT: Science Review of product chemistry, mammalian toxicity, and efficacy studies supporting registration of *Bullfrog Mosquito Coast* (EPA Reg. No. 40086-R), containing 20 % w/w IR3535, 3-[(N-butyl-N-acetyl)amino] propionic acid, ethyl ester, as its active ingredient. The source material is [redacted] (EPA No. [redacted] DP Barcode: 316204. Decision No. 353623.

FROM: Clara Fuentes, Ph.D., Biologist
Biochemical Pesticides Branch
Biopesticides & Pollution Prevention Division (7511C)

TO: Todd Peterson, Ph.D., Regulatory Action Leader
Biochemical Pesticides Branch
Biopesticides & Pollution Prevention Division (7511C)

ACTION REQUESTED

Chattem, Inc. submitted data on product chemistry, toxicity and performance data to support registration of a new mosquito repellent, *Bullfrog Mosquito Coast* (EPA Reg. No. 40086-R), containing 20 % w/w active ingredient IR3535, 3-[(N-butyl-N-acetyl)amino] propionic acid, ethyl ester, and 80 % other inert ingredients.

RECOMMENDATIONS AND CONCLUSIONS.

A. The product chemistry is unacceptable but upgradeable pending correction of the following deficiencies:

1. Correct the discrepancies between the CSF, the product label, and the MSDS concerning the alcohol content and the name of its source material. The CSF and MSDS give a nominal alcohol concentration of 48.67% in the product, while p. 2 of the product label gives 49.08%. The alcohol source material is referred to as "Alcohol SDA 40-2" on the CSF; as "SD alcohol 40" on p. 2 of the product label, and as "Alcohol (SD40)" on the BullFrog® Mosquito Coast™ MSDS (p. 12 of MRID 45916802).

2. Correct the discrepancy between the CSF, the product label, and the MSDS concerning the presence of isopropyl palmitate in the product. Page 2 of the product label lists isopropyl palimate (a misspelling of "palmitate") as an

2. Correct the discrepancy between the CSF, the product label, and the MSDS concerning the presence of isopropyl palmitate in the product. Page 2 of the product label lists isopropyl palimate (a misspelling of "palmitate") as an ingredient, but it is neither included on the CSF nor in the MSDS for BullFrog® Mosquito Coast™

3. Provide MSDSs or specification sheets for the inert ingredients,

4. Provide the temperature at which the product is analyzed,

5. Provide explanation for the lower certified limit for the active ingredient, which is slightly outside the recommended range (7% vs 3% recommended).

6. Correct the typographical error "XAS" for "CAS" No. of octinoxate in column 10 of the CSF.

7. Provide CAS number for [redacted] on the CSF.

8. Correct the year, 2005 for the correct year 2004 in column 21 of the CSF.

9. Verify CAS number for C12-15 alkyl benzoate. CAS numbers 85507-69-3 and 86411-27-8 for *Aloe barbadensis* leaf extract, and C12-15 alkyl benzoate, respectively, are not found in EPA database. *Aloe barbadensis* leaf extract is found under CAS number 94349-62-9.

10. Submit data for corrosion characteristics and storage stability upon completion.

B. Acute Oral, Dermal, and Inhalation toxicity; Primary Eye and Dermal Irritation studies are acceptable.

C. Product performance data, MRIDs 464909-01 and 464909-02, are acceptable.

STUDY SUMMARY

III. PRODUCT CHEMIST

1. Product Identity and Composition.

Deficiencies:

- The alcohol source material is referred to as "Alcohol SDA 40-2" on the CSF; as "SD alcohol 40" on p. 2 of the product label, and as "Alcohol (SD40)" on the BullFrog® Mosquito Coast™ MSDS (p. 12 of MRID 45916802).

- The CSF and MSDS give a nominal alcohol concentration of 48.67% in the product, while p. 2 of the product label gives 49.08%.

- Page 2 of the product label lists isopropyl palimate (a misspelling of "palmitate") as an ingredient, but it is not included on the CSF or in the MSDS for BullFrog® Mosquito Coast™.

- No PC Codes are found in EPA database corresponding to CAS numbers 85507-69-3 and 86411-27-8 for *Aloe barbadensis* leaf extract, and C12-15 alkyl benzoate, respectively.

- No CAS number is provided on the CSF for [redacted]

- The typographical error "XAS" in column 10 of the CSF for octinoxate should be corrected to "CAS.."

- The year, 2005, in column 21 of the CSF is incorrect. It should be 2004 instead of 2005.

2. Description of Beginning Materials

   Deficiencies:
   No MSDS or specification sheet was provided for any of the inert ingredients.

3. Description of Formulation Process
   Deficiencies: None.

4. Discussion of Formation of Impurities
   Deficiencies: None.

5. Preliminary Analysis
   Deficiencies: None.

6. Certified Limits
   Deficiencies:
   The lower certified limit for the active ingredient is slightly outside the recommended range (7% vs 3% recommended), and no explanation is provided.

7. Enforcement Analytical Methods
   Deficiencies: The temperature at which the product is analyzed should be specified.

8. Physical and Chemical Characteristics
   Deficiencies: Data for corrosion characteristics and storage stability should be submitted upon completion.

II. PRODUCT TOXICITY

MRID	Study Type	Classification	Results	Toxicity category
46078201	Acute Oral toxicity	ACCEPTABLE	LD_{50} > 5000 mg/kg	IV CAUTION
46078203	Acute Inhalation	ACCEPTABLE	LC_{50} > 2.02 mg/L	IV CAUTION
46078204	Primary Eye Irritation	ACCEPTABLE	maximum average irritation score = 10.0 at 1 and 24 hours	III CAUTION mildly irritating
46078205	Primary Dermal Irritation	ACCEPTABLE	Primary irritation index = 1.0	IV CAUTION slightly irritating
46078206	Skin Sensitization	ACCEPTABLE	no positive signs after 24 and 48 hours post-treatment.	not a sensitizer
46078202	Acute Dermal	ACEPTABLE	LD_{50} > 5000 mg/kg	IV CAUTION

III. PRODUCT PERFORMANCE

Studies were conducted at 2 separate locations, Candy Abshier Wildlife Management Area in Smith Point, Chambers County, Texas, and Collier-Seminole State Park, Collier County, Florida on September 29, 2004, and October 19, 2004, respectively. Ten test subjects and 2 control subjects exposed one treated arm to the mosquitoes for 8 hours total duration of the test. The control subjects exposed one untreated arm to mosquitoes. The control counts were

averaged to determine landing rates. Adequate biting pressure was determined from the landing rates of the control arms during 5 minute periods measured at half hour intervals during the test. Mosquito densities were in the range of 1 to 20 landings per minute on a 5 minute period. In Texas, one control averaged 11 landings at each 5 minutes exposure, while the other averaged 9.1 landings. Whole body counts were recorded at the start and hourly through the test. The average number of landings was 21.7, from counts ranging from 14 to 38 landings hourly. In Florida, the average number of whole body landings was22.2, with counts ranging from 16 to 28 landings hourly. The criteria for breakdown was 2 mosquito bites within 30 minutes of each other. In both locations, repellency from the test substance lasted more than 8 hours. Mosquitoes were collected and returned to the laboratory for identification. Mosquito specimens collected in Texas were in the genus Ocherotatus (*O. taeniorhynchus, O. fulvus pallens, and O. sollicitans),* Aedes and Culex species. In Florida, the specimens were identified as *Ocherotatus taeniorhynchus,* Aedes, Wyeomyia (*Wyeomyia mitchellii*), and 1 specimen of *Mansonia tittilans.*

BACKGROUND AND REVIEWER COMMENTS

Efficacy data show that the proposed product is effective in repelling mosquitoes up to 8 hours.